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Thailand

BIOFUELS ANNUAL

Annual 2009

Approved By:
Gary Meyer, Agricultural Counselor
Prepared By:
Sakchai Preechajarn and Ponnarong Prasertsri,
Agricultural Specialist

Report Highlights:
Biofuel consumption has grown rapidly in recent years due mainly to the Government's successful campaign in promoting biofuel utilization through compulsory use of biodiesel, price and tax incentive programs, investment promotion, and a campaign to expand planted feedstock area. Biofuel production has increased accordingly. Thailand's ability to produce feedstock for biofuel production to meet fast-growing demand should not be a problem in the short run. Supplies of molasses and cassava roots as feedstock for ethanol production are readily available. However, increasing palm plantings to meet demand for B100 biodiesel has been more challenging due to attractive returns from rubber production.

Post:

Commodities:

Bangkok

Executive Summary:
Biofuel production in Thailand is composed of ethanol and biodiesel. Biofuel production will continue to grow sharply from 767 million liters in 2008 to 965 million liters in 2009 in line with its consumption. Ethanol production is estimated to grow by 29 percent in 2009, as compared with 24 percent for biodiesel.

Biofuel consumption has grown rapidly in recent years due mainly to the Government's successful campaign in promoting biofuel utilization through imposition of compulsory use of biodiesel, price and tax incentive programs, investment promotion, and a campaign to promote planted area expansion. Biofuel consumption is estimated to increase further from 720 million liters in 2007 to 970 million liters in 2009.

Thailand's ability to produce feedstock in biofuel production in meeting a fast-growing demand should not be a problem in the short run, especially supplies of molasses and cassava roots as feedstock for ethanol production. In addition, ethanol and B100 biodiesel plants are currently running about 30-60 percent of total production capacity. This implies that there is still a room for biofuel production. However, increasing palm plantings to meet demand for B100 biodiesel has been more challenging due to attractive returns from rubber production.

There have been no imports of ethanol and biodiesel in recent years. Thailand only exports ethanol, but is likely to drop in 2009 in anticipation of less exportable supplies.

Author Defined:

1. Ethanol

1.1 Production

Table: Numbers of Ethanol Plants and Status in Thailand

Ethanol Plant	Numbers of ethanol plants				Production Capacity (liters/day)
	On-line plants	Under construction plants	Registered plants	**Total**	
Cassava (C)	1	9	11	**21**	8,365,000
Molasses (M)	4	0	1	**5**	675,000
Sugar Cane (S)	0	1	0	**1**	200,000
M+S	6	0	6	**12**	1,810,000
M+C	0	2	3	**5**	770,000
M+S+C	0	0	2	**2**	250,000
C+S	0	0	1	**1**	200,000
Total	**11**	**12**	**24**	**47**	**12,270,000**
Production Capacity (liters/day)	1,700,000	2,600,000	7,970,000	12,270,000	

Source : Department of Alternative Energy Development and Efficiency, Ministry of Energy

Ethanol production is forecast to increase

further in 2009 in line with an upward trend in domestic gasohol consumption following relatively cheaper prices against regular gasoline. The Government has granted additional 2 licenses for molasses/sugarcane-based ethanol production in 2008-09. Accordingly, total amount of license approved is currently 47, with combined production capacity of around 12.3 million liters/day. Despite an increase in new plants approved for ethanol production, only 11 plants are operating with total production capacity at 1.7 million liters/day, of which 10 plants are molasses-based ethanol plants with a combined capacity of 1.4 million liters/day. There is only one tapioca-based ethanol plant with production capacity of 130,000 liters/day. Total ethanol production capacity will reach 2.0 million liters/day in the beginning of 2010.

All plants are currently running at 60-70 percent of total capacity. The ethanol surplus should be reduced to 20 million liters in 2009, as compared to 60 million liters in 2008. By the end of 2009, another five new plants, all of which are tapioca-based ethanol, will be added to production due to increased investment confidence. The Government began to adopt a cost-plus approach as benchmark prices to reflect domestic production cost, instead of an import-parity approach which is based on Brazilian ethanol prices.

1.2 Consumption

Table: Thailand's Gasoline Consumption (Unit: Million Liters)

Type	2003	2004	2005	2006	2007	2008	% change 2007	% change 2008
Gasoline								
Regular (octane 91)	4,550	4,631	4,332	4,464	4,467	3,388	0.1	-24.2
Premium (octane 95)	3,082	2,969	2,240	1,471	1,106	341	-24.8	-69.2
Gasohol								
Gasohol E10 Octane 91	-	0	29	94	244	924	158.5	278.1
Gasohol E10 Octane 95	-	14	646	1,185	1,519	2,439	28.2	60.6
Gasohol E20	-	-	-	-	-	29		
Gasohol E85	-	-	-	-	-	0		

Source: Energy Policy and Planning Office, Ministry of Energy

Unlike biodiesel, the Government does not regulate compulsory use or sale of gasohol (a mixture of ethanol and regular gasoline) to substitute for regular gasoline. However, sales of gasohol will continue to grow steadily due to the government's price incentive program, particularly for E20 (a mixture of 20 percent ethanol and 80 percent premium gasoline) and E85 (a mixture of 85 percent ethanol and 15 percent premium gasoline). Ethanol consumption will definitely increase accordingly.

Gasohol prices should remain 10-15 percent below regular gasoline prices due to excise tax exemption for ethanol. In addition, the Government provides a price subsidy for E20 and E85 gasohol derived from the State Oil Fund, which cause E20 and E85 cheaper than regular gasoline by 20 percent and 50 percent, respectively. The Government also lowers excise tax for E20 vehicle production. The number of gasoline stations that accommodate E20 gasohol also continues to increase.

Table: Price Structure of Gasoline Product in Bangkok (as of May 26, 2009)

Unit: Baht/Liter

Petroleum Product	Premium gasoline	Regular gasoline	Gasohol			
			regular E10	premium E10	premium E20	premium E85
Ex-Refinery Factory Price	15.4693	15.0454	15.7902	15.9765	16.3883	18.1219
Excise Tax	7.0000	7.0000	6.3000	6.3000	5.6000	1.0500
Municipal Tax	0.7000	0.7000	0.6300	0.6300	0.5600	0.1050
State Oil Fund	5.2000	3.9000	0.1700	0.7700	-1.6600	-7.9800
Conservation Fund	0.7500	0.7500	0.2500	0.2500	0.2500	0.2500
Wholesale Price (WS)	29.1193	27.3954	23.1402	23.9265	21.1383	11.5969
Value Added Tax (VAT)	2.0384	1.9177	1.6198	1.6749	1.4797	0.8118
WS+VAT	31.1577	29.3131	24.7600	25.6014	22.6180	12.4087
Marketing Margin	6.9928	2.0812	2.0374	1.9987	2.6374	5.9919
VAT	0.4895	0.1457	0.1426	0.1399	0.1846	0.4194
Retail Price	38.64	31.54	26.94	27.74	25.44	18.82

Note:

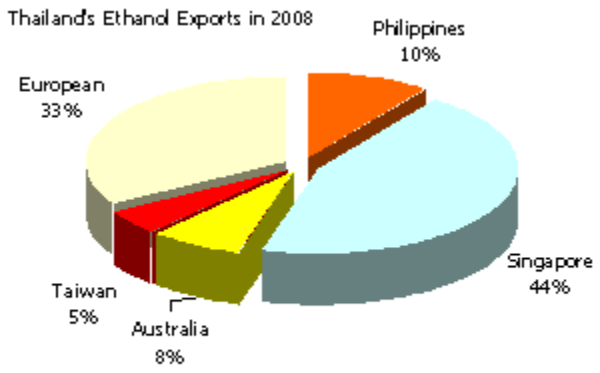
Exchange rate = 34.4749 baht/$

Ethanol reference price = 18.59 baht/liter

Source: Petroleum Division, Enery Policy and Planning Office, Ministry of Energy

Gasohol consumption increased significantly from 4.8 million liters/day in 2007 to 9.3 million liters/day in 2008. As a result, the market share of gasohol increased, at the expense of regular gasoline, from 24 percent of total gasoline consumption to nearly 50 percent in 2008. The increase is attributed to a high gap of prices between E10 (a mixture of 10 percent ethanol and 90 percent premium gasoline) and regular gasoline (8-9 baht/liter). Prices for gasohol were more favorable when the Government reduced an excise tax as a part of the 2008 stimulus package scheme from August 2008 – January 2009 (see TH8139 for background information on pricing). The introduction of E20 gasohol vehicles in early 2008 also boosted gasohol consumption when retail prices for E20 gasohol rare 2 baht/liter below prices for E10.

1.3 Trade



Despite current attractive world ethanol prices, ethanol exports are likely to drop in 2009 in anticipation of less exportable supplies. Domestic ethanol consumption should absorb nearly all domestic production. In addition, most domestic ethanol plants reportedly prefer selling ethanol in the domestic market because their current production facilities are not cost effective for export sales. The Government also discourages ethanol exports in order to guarantee sufficient domestic supplies for gasohol production.

Ethanol exports increased significantly from 14 million liters in 2007 to 31.0 million liters in 2008 due to excess domestic supplies, particularly in the first half of the year. Major buyers of Thai ethanol include Singapore (about 50 percent) and the EU (30 percent), respectively.

1.4 Policy

The first National Ethanol Program and Gasohol Strategic Plan (2004 – 2011) is quite successful when considering escalating ethanol consumption, but its initial target of 1.0 million liters/day is two years behind the plan. The slow response reflected the Government's revision of the plan to promote gasohol consumption through price incentives instead of compulsory phasing out of premium gasoline sales.

The price incentives are implemented through a reduction in the contribution of gasohol sales in the State Oil Fund. Also, excise tax payment is lower as ethanol's excise tax is exempt in gasohol production. The price incentives worked significantly in the second half of 2008 when the Government implemented six-month economic stimulus package (August 2008 – January 2009). Part of the package is to cut the excise tax to almost zero for gasohol, which caused a sharp reduction in gasohol prices to around 13-14 baht/liter (4 cent/liter) lower than premium gasoline prices. In addition, the Government promoted E20 and E85 gasohol consumption through price incentives which is around 2.0 baht/liter (1 cent/liter) and 9.0 baht (26 cent/liter) lower below E10 gasohol, respectively. Also, the Government provided tax incentives to automotive manufacturers who will invest in compatible E20 and E85 vehicles.

Table: 15-year Biofuel Consumption Plan (2008 - 2022)

unit: million liters/day

	2008	2009 - 2011	2012 - 2016	2017 - 2022
Ethanol	0.85	3.00	6.20	9.00
Biodiesel	1.22	3.00	3.64	4.50
Total	**2.07**	**6.00**	**9.84**	**13.50**

Source: Ministry of Energy

Over the medium and long term, the Government has set a 15-year Alternative Energy Development Plan (2008-2022) with the target to increase alternative energy consumption to 20 percent of total energy consumption by 2022. Biofuel consumption will account for 16-17 percent of total alternative energy consumption. The ethanol consumption target will increase from current level of around 1.0 million liters/day to 3.0 million liters/day in the short term, and to 9.0 million liters/day in the longer term. The increase in ethanol consumption will likely be fulfilled by tapioca-based ethanol plants (TH9047).

2. Biodiesel

2.1 Production

In Thailand, twelve biodiesel plants are supplying B100 production as a raw material to petroleum oil refineries for the production of B2 (high-speed diesel with the two percent of B100 content by weight) and B5 biodiesel (high-speed diesel with the five percent of B100 content by weight). Total B100 production in 2008 was 445 million liters, accounting for 34 percent of total production capacities (300 operating days per annum). Due to a compulsory use of B100 for B2 biodiesel production and increased B5 biodiesel demand, B100 production is estimated to increase to 580 and 750 million liters in 2009 and 2010, respectively. Although the Thai Government also promotes the use of low-grade B100 production in rural communities' farming, production is insignificant, only 100-200,000 liters per annum.

Currently, crude palm oil (CPO) and sterin (a by-product of palm oil refinery) are the only feedstock being used for B100 production in Thailand. Although the Government recently conducted research on possible utilization of jatropha seed oil as biodiesel or biomass, no action plan for commercial production has been developed due mainly to insignificant jatropha crop production in the country.

The government policy on mandatory biodiesel production (B2 in 2008 and B5 planned effective in 2011) which warrants sale quantities to manufacturers remains challenging for increasing crude palm oil (CPO) production to meet a rapidly growing demand for B100. Nevertheless, sources in the Ministry of Industry (MOI) believe that CPO supplies should be sufficient if both planted area and productivity in palm plantations increase as planned by the Ministry of Agriculture and Agricultural Cooperatives (MOAC). Details in an action plan to expanding fresh palm production are discussed in a "Policy" section.

2.2 Consumption

Diesel consumption in 2008 dropped by 7 percent from 18,673 million liters (51.16 million

liters/day) in 2007 to 17,325 million liters (47.54 million liters/day) following prevailing record high prices for petroleum products throughout the year and the emergence of a global economic downturn in late 2008. Despite increased use of diesel in the first quarter of 2009 following a sharp reduction in retail gasoline prices, diesel consumption in 2009 is likely to remain unchanged due to a trend of rising global petroleum prices, increased excise taxes on gasoline and a prevailing economic turmoil.

Table: Thailand's Diesel Consumption (Unit: Million Liters)

Type	2003	2004	2005	2006	2007	2008	% change 2007	% change 2008
High Speed Diesel	17,449	19,517	19,341	18,213	18,046	13,572	-0.9	-24.8
Biodiesel B5	-	0	5	43	627	3,780	1360.9	502.4

Note: In this table, high speed diesel represents B2 biodiesel since early 2008.
Source: Energy Policy and Planning Office, Ministry of Energy

Despite a lack of growth in diesel consumption, demand for B100 biodiesel increased dramatically from only 62 million liters in 2007 to 412 million liters in 2008 mainly because the Government successfully enforced a compulsory B2 production policy and attracted the use of B5 biodiesel through a price subsidy program. Demand for B100 is estimated to grow further to about 560 million liters in 2009. In addition to the government intervention, a recovery in overall diesel consumption will partly contribute to increasing demand for B100 to 720 million liters in 2010.

The utilization of B100 for B2 biodiesel production increased from 31 million liters in 2007 to 245 million liters in 2008, while that for B5 production increased from 31 million liters in 2007 to 167 million liters in 2008. B5 biodiesel consumption should exceed B2 consumption by the end of this year mainly because the government's subsidy program has lured many users to switch from B2 to B5. As of May 26, retail prices for B5 are 21.59 baht/liter ($2.08/gallon), 3 baht/liter ($0.39/gallon) cheaper than those for B2.

Table: Price Structure Diesel Product in Bangkok (as of May 26, 2009)

Unit: Baht/Liter

Petroleum Product	Ex-Refinery Factory Price	Excise Tax	Municipal Tax	State Oil Fund	Conservation Fund	Wholesale Price (WS)	Value Added Tax (VAT)	WS+VAT	Marketing Margin	VAT	Retail Price
High speed diesel	14.8680	5.3100	0.5310	-0.1000	0.7500	21.3590	1.4951	22.8541	1.6224	0.1136	24.59
Biodiesel (B5)	15.3939	5.0400	0.5040	-2.9300	0.2500	18.2579	1.2781	19.5360	1.9196	0.1344	21.59

Note:
Exchange rate = 34.4749 baht/$
Biodiesel (B100) reference price = 32.05 baht/liter
Source: Petroleum Division, Enery Policy and Planning Office, Ministry of Energy

Although demand for B100 from petroleum refineries is promising, individual B100 biodiesel manufacturers are struggling to survive in their business. Industry sources reported that all B100 manufacturers faced losses in 2008 when they fiercely competed in offering lower prices for B100 against their increasing costs of raw materials, especially CPO. Contracted prices for B100 between petroleum refineries and B100 manufacturers are normally derived from CPO prices at Malaysian palm oil market plus 3.00-3.50 baht/liter. A group of B100 manufacturers is negotiating with petroleum refineries to switch from CPO price reference at the Malaysian market to domestic market prices based on the fact that Thai B100 manufacturers are using domestic CPO supplies. Domestic CPO prices are typically above prices at the Malaysian market.

2.3 Trade

Biodiesel import must be approved by Ministry of Energy. In 2009, there have been no imports of B100 into Thailand. Thailand does not export B100 biodiesel due to a lack of price competitiveness.

2.4 Policy

In general, the government policy on biodiesel has not been changed from the last Annual report. As of February 1, 2008 the Royal Thai Government (RTG) began to enforce compulsory production of B2 biodiesel throughout the country. While the Government is phasing out its price subsidy for B2 production, it has granted a subsidy from the State Oil Fund to keep retail prices for B5 three baht/liter ($0.39/gallon) below those for B2. In addition, the Government continues its plan to push compulsory biodiesel production up from B2 to B5 across the country in 2011.

Realizing that Thailand needs to increase palm oil production to meet the demand, the joint working group from the Ministry of Agriculture and Cooperatives and the Ministry of Energy, called "Committee on Biofuel Development and Promotion" (CBDP), developed a plan to expand palm growing area by 400,000 hectares in 5 years (from 2008-2012) or by 80,000 hectares annually. Additionally, the Government would seek to increase fresh palm productivity from 19 tons/hectare to 22 tons/hectare, and to increase the crushing rate of crude palm oil from 17 percent to 18.5 percent by 2012. To achieve the plan, the RTG would provide low-interest loans to participating oil palm farmers. Based on its earlier estimated diesel demand of 22,860 million liters (62.6 million liters per day) in 2012, mandatory B5 production could lead to demand of 1.08 million tons of crude palm oil and stearin for biodiesel production.

Increasing palm plantings to meet demand has been challenging. According to Office of Agricultural Economics (OAE), MOAC, harvested palm area increased by 34,000 hectares in 2008 and is estimated to increase by 52,000 hectares in 2009. The increase is apparently below the target of 80,000 hectares of acreage increase in each year. This below-target expansion is attributed to more attractive returns from rubber production and a lack of good incentives.

However, Thailand's fresh palm production was abundant in 2008 due to increased harvested area and higher yields. Reflecting new area expansion, harvested area increased by 8 percent in 2008 to 460,000 hectares. Meanwhile, average yield for fresh palm production increased tremendously (35 percent) from 14.99 tons/hectare in 2007 to 20.16 tons/hectares in 2008 due mainly to extremely favorable weather condition in 2006. Total CPO production was reported to increase sharply from 1.05 million tons in 2007 to 1.54 million tons in 2008. As a result, supply availabilities were not a problem for B100 manufacturers in 2008. In 2009, CPO production is estimated to be close to the 2008 level when the impact of continued increase in harvested area may be offset by lower yields following relatively dry conditions in 2007.

Statistics:

Table 1. Thailand's Quantity of Feedstock Use in Biofuel Production (Metric Ton)

	2005	2006	2007	2008	2009
Biodiesel					
Soybean oil	-	-	-	-	-
Rapeseed oil	-	-	-	-	-
Palm oil	190	190	64,500	422,000	521,600
Coconut oil	-	-	-	-	-
Animal fats	-	-	-	-	-
Recycled vegetable oil	-	-	-	-	-
Other	-	-	-	-	-
Ethanol					
Corn	-	-	-	-	-
Wheat	-	-	-	-	-
Sugarcane	-	25,000	57,345	60,000	70,000
Sugar beat	-	-	-	-	-
Rye	-	-	-	-	-
Molasses	292,105	440,800	613,663	1,159,646	1,516,800
Wood	-	-	-	-	-
Cassava/tubers	-	163,800	240,240	196,560	218,400

Table 2. Thailand's Production, Supply and Demand for Biofuel (Million Liters)

	2005	2006	2007	2008	2009
Biodiesel and Ethanol					
Beginning stock	-	29	36	61	77
Production	75	137	260	767	965
Imports	24	-	-	-	-
Total Supply	99	166	296	828	1,042
Exports	-	-	14	31	20
Consumption	70	130	221	720	970
Ending Stocks	29	36	61	77	52
Total Demand	99	166	296	828	1,042

End of report